A Review of Mise a la Masse Surveys at Elura

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Only limited mise à la masse (applied potential) surveys were conducted at Elura during exploration drilling because the holes usually collapsed immediately after casing removal. This prevented the implanting of mise à la masse current electrodes into the massive sulphide intersections and the logging of holes with electrical tools. A surface survey (Ogilvy, 1976) was conducted by the Bureau of Mineral Resources in 1974 using the sulphide intersection in DDHE2 to energise the orebody. Hole to hole measurements between energised intersections in DDHE2 and DDHE3 and potential measurement hole DDHE5 were also conducted by the Geological Survey of N.S.W. in 1974 (Tyne, 1975).

Fig. 1 presents the surface distribution of mise à la masse potentials for the energising electrode in DDHE2. The major axis of the contour pattern coincides with the northerly strike of the orebody. The centre of the equipotential pattern is shifted about 100m south of the surface projection of the energising electrode. Generally, the equipotential maximum will occur over the centre of a conductive sulphide body irrespective of the position of the energising electrode. Even though the anisotropic behaviour of the country rocks usually contributes to the elongation of the equipotential pattern along strike, it cannot account for the marked shift in the centre of the equipotential pattern. This early mise à la masse survey indicates that the sulphide intersection in DDHE2 is part of a larger conductive sulphide mass centred below 19950N/20150E.

Fig. 2 shows the relative location of DDHE2, DDHE3 and DDHE5 and the location of the energising electrodes. Fig. 3 presents the potential measurements obtained in DDHE5

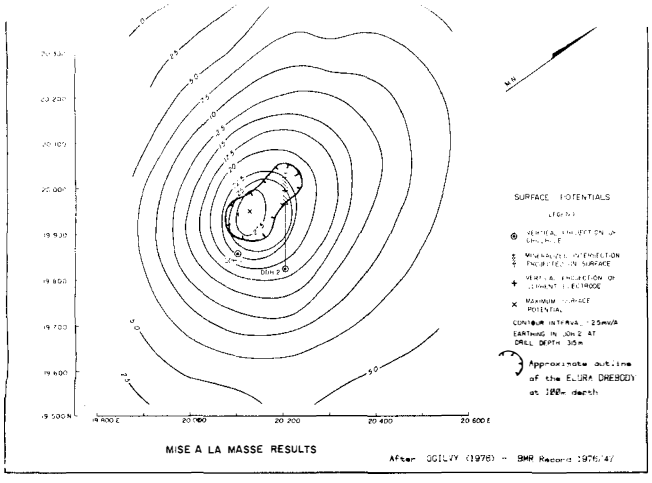

FIGURE 1

Surface mise à la masse results

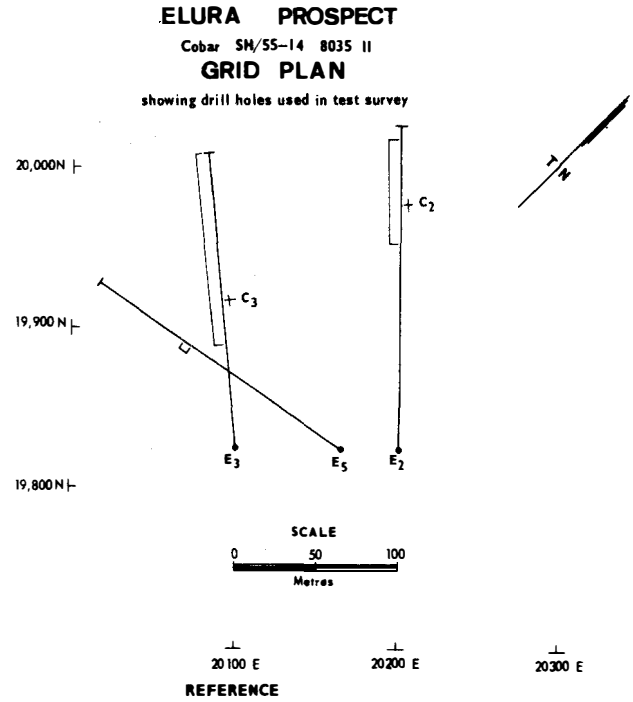

FIGURE 2

Grid plan of DDHE2, 3 and 5

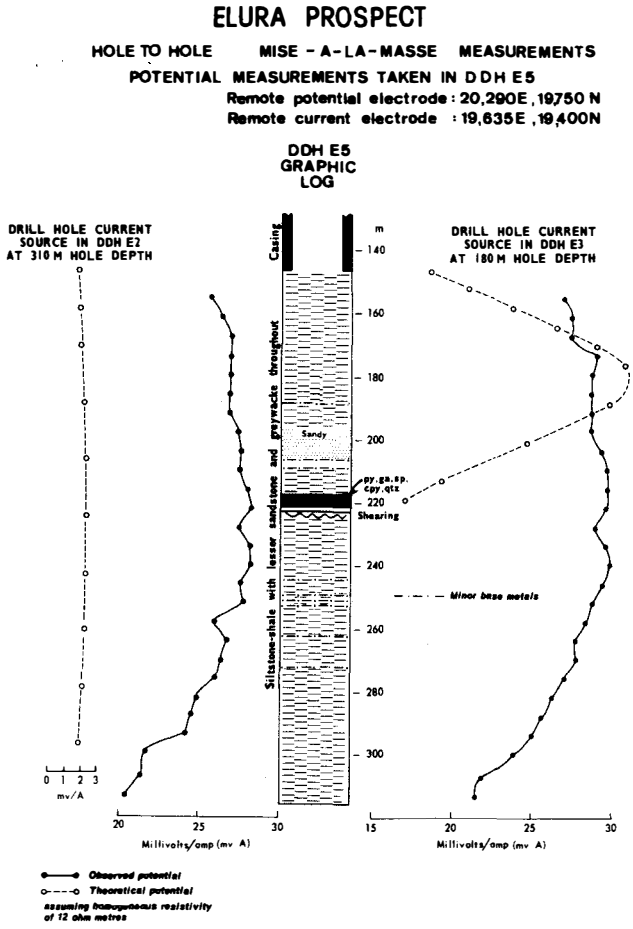

FIGURE 3

Hole to hole potential measurements in DDHE5

for energisation of the orebody in holes DDHE2 and DDHE3. An expected potential distribution for a homogeneous earth is also compared with the observed potentials. There are clear disagreements. The observed potentials for both current sources are almost identical even though the source in DDHE2 is more than 100m further north than the source in DDHE3. This lack of fall-off in observed potential confirms that both current sources lie within the same massive conductor.

These limited examples of mise à la masse surveying at Elura confirm the efficacy of the technique in establishing continuity of conductive sulphides between widely spaced drill hole intersections. It will be necessary in the future to overcome the logistical problems of conducting drill hole geophysics in highly weathered terrains. Perhaps the use of a perforated plastic casing placed permanently in completed holes will assist in maintaining access to important sulphide intersections.

Acknowledgements

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Tyne, E. D. (1980). A Review of Mise a la Masse Surveys at Elura. Exploration Geophysics, 11(4), 44–45. https://doi.org/10.1071/EG9804044

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